UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,351	12/27/2000	Byoung Whi Kim	300055.481	8816

500	7590	10/07/2003		

SEED INTELLECTUAL PROPERTY LAW GROUP PLLC
701 FIFTH AVE
SUITE 6300
SEATTLE, WA 98104-7092

EXAMINER
CHAN, ALEX H

ART UNIT	PAPER NUMBER
2633	6

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/751,351	KIM ET AL.
	Examiner	**Art Unit**	
	Alex H Chan	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 December 2000</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 December 2000</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

  If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☒ All b)☐ Some * c)☐ None of:

    1.☒ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____ .

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

  a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1.   **Claim 2** is objected to because of the following informalities:

a.   "(m=n)" is claimed when explanation for "m" has not been described in its

previous claim(s).

Claim 18 is objected to because of the following informalities:

b.   It is not clear as to what "said routing step" and "said grouping step" are being

referred to when claim 17 only describes "routing the paths" and "grouping the packets."

The "step" has not been properly described.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   **Claims 1, 2, 3, 22, 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Patent No. 5,576,875 to Chawki et al (hereinafter referred to as Chawki) in view of U.S.

Patent No. 5,796,501 to Sotom et al (hereinafter referred to as Sotom).

Regarding claim 1, Chawki discloses a WDM optical networks enabling the transfer of

information elements (Internet Protocol) (Col. 5, lines 43-45) comprising a plurality of sub-ring

(e.g. B1, B2, and B3 of Fig. 2a) for connecting two or more stations (n number of terminals)

(Col. 2, lines 58-59) to which unique user wavelengths are respectively allocated (TABLE 1,

Col. 5, lines 30-40); a main ring (e.g. B0 of Fig. 2a) for connecting n number of connection

nodes connecting sub-rings to which unique user wave lengths are respectively allocated (e.g.

Fig. 3 and Col. 4, lines 17-21); a single station head (sub-ring controller) (e.g. T of Fig. 2a that

interconnects B1 and B0) connected to said single sub-ring (e.g. B1 of Fig. 2a) and said main

ring (e.g. B0 of Fig. 2a), and controlling the flows of a wavelength (packet) transmitted/received

inside said sub-ring (e.g. via laser 1 for transmitting and receiver P0 for receiving, Fig 2b) and a

packet transmitted/received between said sub-ring and said main ring (e.g. via STM1 of Fig. 2b);

and a main ring controller (e.g. M1 of Fig. 5) for controlling the flow of a packet

transmitted/received (e.g. via D21 as receivers and lasers (not numbered) as transmitters, Col. 5,

lines 18) inside said main ring.

However, he fails to disclose a main ring controller wherein said terminals and

connection nodes each add/drop only their own unique wavelength signals, said sub-ring

controller and main ring controller drop all the wavelength division multiplexed signals to

de-multiplex the signals, load each of said signals on their unique user wavelengths in their

destination terminals, and then multiplex again said signals to transmit to said sub-ring and main

ring, and said sub-ring controller adds the identifying code of the sub-ring having a destination

terminal, to the transmitted packet, and then transmits it to said main ring.

Sotom discloses a network controller (main controller) (1 of Fig. 1) wherein each node

(terminals and connection nodes) (e.g. N_i of Fig. 1) is associated with a receive wavelength λ_i

and with a send wavelength (own unique wavelength signals) (Col. 3, lines 20-23) for receiving

and sending wavelength (add/drop) (e.g. via 13, 25 and 26 of Fig 4). He also discloses this

network controller (i.e. can be for sub-ring controller or main ring controller) drop all WDM

signals (e.g. via output Si of Fig. 3 and input Em of Fig. 4) to demultiplex the signals (e.g. via 27

of Fig. 5), establishing (loading) the correspondences between the wavelengths (i.e. signals) of

the addressees of the messages and the wavelengths conveying those messages (unique user

wavelengths) at the input of network controller (Col. 5, lines 56-65 & Col. 6, lines 20-26), and

then multiplex (e.g. via 18 of Fig. 4) again these wavelengths (signals) to transmit to sub-ring

and main-ring (Fig. 6). He further discloses that a respective label (identifying code), which is

associated to specific send wavelength (packet) for identifying the destination nodes (destination

terminals) of the messages, is adapted in each node (Col. 1, lines 57-61). Accordingly, one of

ordinary skill in the art would have been motivated to incorporate this network controller to

accomplish the above means because to improve the throughput of the network, it is desirable for

each node to be able to send messages and the associated labels simultaneously without problems

of collision (Col. 2, lines 12-14). Therefore, it would have been obvious to one of ordinary skill

in the art at the time the invention was made to have modified the WDM optical network of

Chawki by incorporating a network controller that accomplishes the process means, as taught by

Sotom, in addition to the station heads of Chawki as main ring and sub-ring controllers because

Sotom suggests that this would improve the throughput of the network.

Regarding claim 2, Chawki in view of Sotom discloses the number of the sub-rings

connected to said main ring and the number of the terminals connected to one sub-ring are same

(m=n) (e.g. B0 of Fig. 1 has 3 sub-rings (B1/B2/B3) and B1 has 3 stations, Chawki), the n

number of wavelengths ($\lambda_1 \sim \lambda_n$) allocated to each of the sub-rings in the main ring, and the n

number of wavelengths ($\lambda_1 \sim \lambda_n$) allocated to each of the terminal in a given sub-ring are shared

(e.g. Fig. 4b and Col. 4, 31-32, Chawki), whereby the n^2 number of terminals are supported by

the n number of wavelengths ($\lambda_1 \sim \lambda_n$) (e.g. There are four wavelengths (λ_1-λ_4 of Fig. 2b) with a total of 16 stations (terminals) in Fig. 2a, Chawki or two wavelengths λ_1 and λ_2 for Node N1 and Node N2 and their respective stations ST1 and ST2 for total of 4 terminals, Fig. 1, Sotom).

Regarding claim 3, Chawki in view of Sotom discloses terminals and connection nodes include a wavelength coupler (e.g. C1 of Fig. 5, Chawki) for adds/drops (Col. 8, lines 5-6, Chawki) only its own unique user wavelengths.

Regarding claim 22, Chawki in view of Sotom discloses all limitations as recited in claim 1, further discloses a ring network (Fig. 2a, Chawki or Fig. 1, Sotom) for connecting said n number of terminals (e.g. S of Fig. 2a, Chawki or NODE of Fig. 1, Sotom) and said single controller (e.g. T of B0 of Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom) in a ring shape, wherein wavelength division multiplexed signals are transmitted (e.g. Input E_m of Fig. 4 or E_i of Fig. 3, Sotom).

Regarding claim 23, Chawki in view of Sotom discloses any one terminal (S4 of Fig. 2b, Chawki) belonging to said ring network (e.g. ring RA of Fig. 6, Sotom) and any one terminal (e.g. S1 of Fig. 2b, Chawki) belonging to other ring network (e.g. ring RB of Fig. 6, Sotom) are connected, the same unique user wavelength is allocated to said two terminals (Col. 2, 59-60 & Col. 4, lines 45-46, Chawki), whereby as communication between said two ring networks are made possible via said two terminals (e.g. via T of Fig. 2b, Chawki), said ring networks are horizontally extended, respectively (e.g. Fig. 2a or 2b, Chawki or Fig. 6, Sotom).

4.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chawki in view of Sotom as applied to claim 1 above, and further in view of U.S. Patent No. 6,020,986 to Ball.

Regarding claim 4, Chawki in view of Sotom teaches a wavelength coupler but does not teach a wavelength coupler that includes an input circulator, a fiber Bragg grating for reflecting an unique user wavelength from a corresponding terminal and for passing other wavelengths, and an output circulator, said input circulator transfers the wavelength division multiplexed signal inputted via said sup-ring to said fiber Bragg grating and drops the unique user wavelength from the corresponding terminal, that is reflected by said fiber Bragg grating, said output circulator transfers the signal added at the corresponding terminal to said output terminal of said fiber Bragg grating and transmits said signal along with the signal passed through said fiber Bragg grating to said sub-ring.

Ball teaches an optical switch (wavelength coupler) (Fig. 4) that includes an input circulator (32 of Fig. 4), a fiber Bragg grating (36 of Fig. 4) for reflecting an unique user wavelength (Col. 6, lines 39-42) from a corresponding terminal and for passing other wavelengths (Col. 6, lines 39-57), and an output circulator (34 of Fig. 4), wherein the input circulator transfers multi-wavelength optical beam (WDM signal) (40 of Fig. 4 and Col. 3, lines 57-58) to fiber Bragg grating and routes out (drop) the optical beam (which consists of unique wavelength), that is when fiber Bragg is set to the reflective state (i.e. reflected) (Col. 5, lines 46-48), and the output circulator transfers a second beam (44 of Fig. 4) to be routed (signal added) to exit port 46 and transmits the beam along with signal passed through fiber Bragg grating to the output. Accordingly, one of ordinary skill in the art would have been motivated to incorporate an input and output circulators and a fiber Bragg grating to provide an optical add/drop module that can be inserted into an optical network to allow for dynamic reconfiguration (Col. 3, lines 1-3). Therefore, it would have been obvious at the time the invention was made to modified the WDM

optical network of Chawki by incorporating circulators and fiber gratings, as taught by ball, in

wavelength couplers in order to construct an optical network that allows for dynamic

reconfiguration.

5.   **Claims 5-7, 9-14, 16-19, 24** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Chawki in view of Sotom as applied to claim 1 above, and further in view of U.S. Patent

No. 5,289,302 to Eda.

        Regarding claim 5, Chawki in view of Sotom discloses all limitations as cited in

rejecting claim 1 above, further discloses a routing means (e.g. combination of decoder 20 of

Fig. 4, processor unit 23 of Fig. 4 and switching stage 60 of Fig. 7 or 16 of Fig. 4, Col. 6, lines

12-40, Sotom) for establishing the path (e.g. via supplying the wavelength (message) at the

output with sender wavelength λ_i and converting it to receiver wavelength λ_j or by indicating the

number of the ring to which the destination node of each message belongs, Col. 20-40 & Col. 6,

lines 49-54) of the de-multiplexed packet by the destination terminal, using the destination

terminal address (e.g. address label to be produced via decoder 20, Col. 6, lines 14-16, Sotom)

included in the packet; a packet grouping means (e.g. processor unit 23 of Fig. 4) for grouping

the packet for which its path is established by its destination terminal (e.g. processor unit has the

ability to cause messages from nodes belonging to one ring and transfer them to another using

address labels produced by decoder 20 of Fig. 4, Col. 6, lines 64-67 or send locally as in Fig. 1);

        However, Chawki in view of Sotom does not explicitly teach a wavelength allocating

means for loading said packet grouped by its path on the unique user wavelengths of said

destination terminals. Eda discloses a packet being checked the status of the destination node by

a supervisory node (wavelength allocating means) and selects (loading) a currently unused one

out of the second through N^{th} optical wavelength (unique user wavelength) in the used

wavelength field (UWL of Fig. 4) and sends out the packet (Col. 3, lines 53-64). Accordingly,

one of ordinary skill in the art would have been motivated to incorporate this wavelength

allocating means to provide a way for nodes to identify a packet having a receive node address

identical with its own node address (Col. 2, lines 35-38). Therefore, it would have been obvious

to one of ordinary skill in the art at the time the invention was made to have modified the WDM

optical network of Chawki in view of Sotom to include a wavelength allocating means for the

purpose of a node identifying a packet that has an identical node address as the node and

receiving the packet.

Regarding claim 6, Chawki in view of Sotom and Eda discloses packet grouping means

include at least n number of buffers (e.g. buffer memory, 15 of Fig. 4, Sotom) for storing the

packets discriminated by their destinations (e.g. destination address given by decoder 20 of Fig.

4, & Col. 6, lines 15-16, Sotom).

Regarding claim 7, Chawki in view of Sotom and Eda discloses a λ tag attachment

means (a frame composition, Fig. 4 and Col. 3, lines 21-25, Eda) for attaching the λ tag (ID, DA,

SA and UWL of Fig. 4, Eda) according to the path of the packet determined by said packet

routing means (e.g. determined by 24 and 28 of Fig. 5, Eda or combination of decoder 20 of Fig.

4, processor unit 23 of Fig. 4 and switching stage 60 of Fig. 7 or 16 of Fig. 4, Col. 6, lines 12-40,

Sotom); a frame means (e.g. any node, Fig. 1A-1J, Eda) for combining said λ tag and said packet

to expand the combined packet with a determined transmission packet (e.g. Fig. 4, Eda) (Col. 3,

lines 46-5, Eda); a wavelength controller for transforming (e.g. 28 of Fig. 5, Eda or combination

of wavelength selectors and converters of Fig. 4 & Col. 6, lines 20-26, Sotom) said expanded

packet into its own unique user wavelength (Col. 5, lines 36-45, Eda);; and a light transmitter for

transmitting (1, 2, 3, or 4 of Fig. 2b, Chawki or transmitter inside 18 of Fig. 4, Sotom or 23 of

Fig. 5, Eda) into its own unique user wavelength signal of said expanded packet to said main

ring.

Regarding claim 9, Chawki in view of Sotom and Eda discloses all limitations as

discussed above, further discloses a λ tag delineator (e.g. T of B0 of Fig. 2a, Chawki, or Fig. 4 or

Fig. 7, Sotom, or Fig. 5, Eda) for delineating a destination (e.g. via wavelength conversion so

that the associated messages are conveyed by wavelength of addressees of those messages and

wavelength extraction and insertion means, Col. 4, lines 1-10, Sotom or via 205 and 208 of Fig.

5 or ID, DA, and UWL of Fig. 4, Eda) sub-ring using the λ tag added to the packets; a λ-tag

based switching section (e.g. optical switches SW1-SWn of Fig, 5, Sotom) for distributing the

packets (e.g. via 20 and 23 of Fig. 4, Sotom & Col. 6, lines 30-34) by their destinations (e.g.

node N_j of Fig. 1, Sotom) according to the λ-tag of the destination terminal (e.g. wavelength λ_i,

Sotom); at least n number of buffers (e.g. buffer memory, 15 of Fig. 4) for storing the packets

distributed; at least n number of lead frame sections for reading (e.g. detected by detectors) (e.g.

via 5 of Fig. 3 or 19 and 20 of Fig. 4, Sotom) the packets from each of the buffers and for adding

the λ-tag corresponding to said destination (e.g. via 10 and 11 of Fig. 3 or via combination of 20,

23 and 16 of Fig. 4, Col. 6, lines 12-40, Sotom, or via 24 of Fig 5 or via ID, DA, and UWL of

Fig.4 and Col. 8, lines 1-9, Eda); and the n number of transmitters (1, 2, 3, or 4 of Fig. 2b,

Chawki or transmitters inside 18 of Fig. 4, Sotom or 23 of Fig. 5, Eda) for reading the packets

from each of the buffers to transmit the packets with optical signals having wavelength allocated

to said destination (e.g. λ_i is used for node N_i and λ_j is used for node N_j, Fig. 1, Sotom).

Regarding claim 10, Chawki in view of Sotom and Eda discloses a ring that is extended

horizontally (e.g. Fig. 2a, Chawki or Fig. 6, Sotom) by connecting n number of said connection

nodes (e.g. any node in Fig. 6, Sotom) of said main ring (e.g. ring RB of Fig. 6, Sotom) and n

number of connection nodes of another main ring (e.g. ring RA of Fig. 6, Sotom) by means of

gateway controller (e.g. T of Fig. 2a, Chawki, or Fig. 4 or Fig. 7 or network controller of Fig. 6,

Sotom, or Fig. 5, Eda), a transmitting part (e.g. via 24 of Fig. 5 or Fig. 8, Eda or 1 of Fig. 2b,

Chawki) of said sub-ring controller (e.g. T of Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom, or Fig.

5, Eda) adds an identifying code (e.g. 19, 12-15 of Fig. 2 or Fig. 4, Eda) of the connection node

to a packet (Fig. 2 or Fig. 4, Eda) for transmitting, and then transmits it to a transmitting part of

said main ring, said gateway controller transforms an identifying code (e.g. label D_{ij}, Col. 12-26,

Sotom) of said packet into identifying codes (e.g. wavelength converted to receiver wavelength

λj, Col. 6, lines 27-40) of said connection nodes connected with a receiving part of said sub-ring

(e.g. P0 of Fig. 2b, Chawki), and then transmits it to a receiving part of said main ring.

Regarding claim 11, Chawki in view of Sotom and Eda discloses a plurality of

intermediate rings (e.g. B0 of Fig. 2a or Fig. 5, Chawki) connected with the plurality of said

sub-rings (e.g. B1, B2 or B3 of Fig. 2a, Chawki) make a structure of a three-layer structure (e.g.

as shown in Fig.2a) by connecting with said main ring, said intermediate ring having

intermediate ring controllers (e.g. T of B0 of Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom, or Fig.

5, Eda) for controlling a path of the packet, said sub-ring controller (e.g. T that interconnects B1

and B0 of Fig. 2a, Chawki) adds identifying code of the intermediate ring (e.g. via adding

destination address DA of Fig. 4, Eda) having destination terminal and identifying code of said

sub-ring (e.g. via send node address SA of Fig. 4, Eda), to the packet for transmitting, and then

transmits extended packet; said intermediate ring controller confirms identifying code of said

intermediate ring (e.g. via circuit facility (not shown), Col. 6, lines 49-54, Sotom, or via 26, 216

and 29 of Fig. 5 and Col. 6, lines 49-58, Eda or via 13, 19, 20 and 23 of Fig. 4, Sotom) included

in the extended packet transmitted from said sub-ring, and if a state of the identifying code is null

(i.e. DA is not at destination, Fig. 4, Eda), said intermediate ring controller confirms identifying

code of said sub-ring, and then transmits said extended packet to said sub-ring having said

destination terminal (e.g. via 21 of Fig. 5, or to terminal 208 of Fig. 5, Eda), and if the state is not

null (i.e. DA is not at destination, Fig. 4, Eda), it transmits said extended packet to said main

ring; and said main controller (e.g. T of B0, Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom, or Fig.

5, Eda) confirms (e.g. via circuit facility (not shown), Col. 6, lines 49-54 or via 13, 19, 20 and 23

of Fig. 4, Sotom, or via 26, 216 and 29 of Fig. 5 and Col. 6, lines 49-58, Eda) identifying code

(e.g. by reading of message, Col. 3, lines 53-55.Sotom, or reading DA of Fig. 4, Eda) of said

intermediate ring included in the extended packet, and then changes said identifying code of said

intermediate ring into a null state (e.g. by changing wavelength that corresponds to address of

destination, Col. 3, lines 21-23, Sotom or writing new DA of Fig. 4 & Col. 3, lines 46-52 or via

24 and 28 of Fig. 5, Eda), and then transmits said extended packet to said intermediate ring

having said destination terminal.

Regarding claims 12-13, the limitations introduced by claims 12-13 correspond to the

limitations introduced by claims 5-6, respectively. The treatment of claims 5-6 above reads on

the corresponding limitations of claims 12-13.

Regarding claim 14, Chawki in view of Sotom and Eda discloses all limitations as

recited in claim 7, further discloses a main ring along which the path of the wavelength division

multiplexing signal transverses (e.g. Fig. 6, Sotom or Fig. 2a or 2b, Chawki), and a sub-ring (e.g. B1 of Fig. 2a, Chawki or ring RA of Fig. 6, Sotom) connected via said sub-ring controller (e.g. T of B0 of Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom, or Fig. 5, Eda) to a plurality of connection nodes (e.g. NODE of Fig. 6, Sotom or S of B0 of Fig. 2a, Chawki) in said main ring (e.g. B0 of Fig. 2a, Chawki or ring RB of Fig. 6, Sotom) to which unique user wavelengths are allocated, respectively (e.g. Col. 4, lines 17-20, Chawki or Col. 3, lines 15-38, Sotom), said sub-ring controller for adding an unique user wavelength information (e.g. via ID, DA, and UWL of Fig. 4, Eda) on the destination sub-ring to a packet to be transmitted from its own sub-ring to other sub-ring.

Regarding claim 16, the limitations introduced by claim 16 correspond to the limitations introduced by claim 9. The treatment of claim 9 above reads on the corresponding limitations of claim 16.

Regarding claim 17, the limitations introduced by claim 17 correspond to the limitations introduced by claim 5. The treatment of claim 5 above reads on the corresponding limitations of claim 17. There is one additional limitation claimed in claim 17; that is whereby destination terminal drops said grouped packets (e.g. node 6 dropping λ_2 in Fig. 6, Eda or via 13 of Fig. 4, Sotom).

Regarding claim 18, the limitations introduced by claim 18 correspond to the limitations introduced by claim 6. The treatment of claim 6 above reads on the corresponding limitations of claim 18. There is one additional limitation claimed in claim 18; that is the routing step including delineating the packets by their destination terminals (e.g. via wavelength conversion so that the associated messages are conveyed by wavelength of addressees of those messages and

wavelength extraction and insertion means, Col. 4, lines 1-10, Sotom or via 205 and 208 of Fig. 5 or ID, DA, and UWL of Fig. 4, Eda).

Regarding claim 19, the limitations introduced by claim 19 correspond to the limitations introduced by claim 7. The treatment of claim 7 above reads on the corresponding limitations of claim 19. There is also one additional limitation recited in claim 19; that is a plurality of connection nodes of sub-ring (e.g. ring RA of Fig. 6, Sotom) connected via a main ring (e.g. ring RB of Fig. 6, Sotom) along which the path (e.g. the path which Em or Sm of Fig. 4 travels, Sotom) of the wavelength division multiplexing signal (e.g. Em of Fig. 4, Sotom) transverses (e.g. Fig. 6, Sotom or Fig. 2a or 2b, Chawki), the method in said sub-ring controller for adding an unique user wavelength information (e.g. via combination of decoder 20 of Fig. 4, processor unit 23 of Fig. 4 and switching stage 60 of Fig. 7 or 16 of Fig. 4, Col. 6, lines 12-40, Sotom, or via ID and UWL of Fig.4, Eda) on the destination sub-ring to the packet to be transmitted from its own sub-ring to other sub-ring to transmit the packet to said main ring (e.g. Col. 6, lines 43-67, Sotom).

Regarding claim 21, the limitations introduced by claim 21 correspond to the limitations introduced by claim 9. The treatment of claim 9 above reads on the corresponding limitations of claim 21. There is one additional limitation claimed in claim 21; that is the main ring controller for receiving the expanded packet to which the λ tag is attached from source sub-ring to transmit the packet to the destination sub-ring.

Regarding claim 24, the limitations introduced by claim 24 correspond to the limitations introduced by claim 4. The treatment of claim 4 above reads on the corresponding limitations of claim 24.

6.   **Claims 8, 15 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Chawki in view of Sotom and Eda as applied to claim 5 above, and further in view of U.S. Patent

No. 5,646,758 to Miki et al (hereinafter referred to as Miki).

Regarding claim 8, Chawki in view of Sotom and Eda discloses all limitations as

discussed above, further discloses an optical receiver (e.g. P0 of Fig. 2b, Chawki or 10 of Fig. 4,

Sotom or receiver inside 22 or 28 of Fig. 5, Eda) for receiving the unique user wavelength signal;

a λ tag delineating means (e.g. via wavelength conversion so that the associated messages are

conveyed by wavelength of addressees of those messages and wavelength extraction and

insertion means, Col. 4, lines 1-10, Sotom or via 205 and 208 of Fig. 5 or ID, DA, and UWL of

Fig. 4, Eda) for delineating said λ tag to transmit the packet to the routing means. However,

Chawki in view of Sotom and Eda fails to disclose a reframe means for synchronizing said

received signal and for receiving the packet including CRC (cyclic redundancy check). Miki

discloses receiving means and decision means (reframe means) for determining that the receiving

signal from receiving means is not a regular signal when a predetermined signal after the frame

pattern, which was detected by frame synchronization circuit (Col. 15, lines 3-18) and when

detecting a cyclic redundancy check bit error for receiving signal (Col. 15, lines 19-24).

Accordingly, one of ordinary skill in the art would have been motivated to incorporate a

receiving and decision means for synchronizing received signals and for receiving CRC to

provide a optical system which can reduce the influence of optical reflection and mis-

synchronization by simple configuration without decreasing transmission efficiency (Col. 1, lines

64-65 and Col. 2, lines 59-64). Therefore, it would have been obvious to a person of ordinary

skill in the art to modified the optical network of Chawki in view of Sotom and Eda by

incorporating reframe means as receiving and decision means to reduce mis-synchronization without transmission efficiency.

Regarding claim 15, Chawki in view of Sotom, Eda and Miki discloses all limitations as recited in claim 8, further discloses a main ring along which the path of the wavelength division multiplexing signal transverses (Fig. 6, Sotom or Fig. 2a or 2b, Chawki), and a sub-ring (e.g. B1 of Fig. 2a, Chawki or ring RA of Fig. 6, Sotom) connected via said sub-ring controller (e.g. T of B0 of Fig. 2a, Chawki, or Fig. 4 or Fig. 7, Sotom, or Fig. 5, Eda) to a plurality of connection nodes (e.g. NODE of Fig. 6, Sotom or S of B0 of Fig. 2a, Chawki) in said main ring (e.g. B0 of Fig. 2a, Chawki or ring RB of Fig. 6, Sotom) to which unique user wavelengths are allocated, respectively (e.g. Col. 4, lines 17-20, Chawki or Col. 3, lines 15-38, Sotom), said sub-ring controller for delineating a λ tag (e.g. via wavelength conversion so that the associated messages are conveyed by wavelength of addressees of those messages and wavelength extraction and insertion means, Col. 4, lines 1-10, Sotom or via 205 and 208 of Fig. 5 or ID, DA, and UWL of Fig. 4, Eda) from the signal received from said main ring to transmit the signal to the destination terminal.

Regarding claim 20, Chawki in view of Sotom, Eda and Miki discloses all limitations as disclosed above, further discloses a method in said sub-ring controller for delineating the λ-tag (e.g. via wavelength conversion so that the associated messages are conveyed by wavelength of addressees of those messages and wavelength extraction and insertion means, Col. 4, lines 1-10, Sotom or via 205 and 208 of Fig. 5 or ID, DA, and UWL of Fig. 4, Eda) from the signal received (e.g. via input Em of Fig. 4, Sotom or D21 of Fig. 5, Chawki) from said main ring to transmit

(e.g. via output Sm of Fig. 4, Sotom or via T of Fig. 2v, Chawki) the signal to the destination terminal.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chawki, Sotom, Eda are cited to show related work in Internet Protocols over WDM and methods of communication respective terminals. Ball is cited to show related work in circulators and fiber Bragg gratings and add/drop multiplexers. Miki is cited how synchronization and fault detection including cyclic redundancy check is done.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner
September 25th, 2003

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600